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GUIDED INQUIRY LEARNING IMPLEMENTATION TO IMPROVE STUDENT LEARNING OUTCOMES IN THE SUBJECT MATTER OF REACTION RATE FACTOR

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Abstract

This study aimed to describe the learning implementation and the students learning outcomes through the guided inquiry learning in the subject matter of the factors which affect the reaction rate. Using the one group pretest-posttest design, this study used quantitative research. The object of the study is the students of SMA Muhammadiyah 4 Surabaya who are in the current year of 2016-2017 - X1 IPA 1 class. In order to gain the appropriate findings, the authors used the learning implementation sheet which was obtained by the observation in describing the learning implementation and the pretest-posttest sheet which was obtained by doing a test in describing the students learning outcomes. The results of the study demonstrated that by using the guided inquiry learning in the implementation learning, the average percentage of the first meeting (using the concentration and the surface area factors) and the second meeting (using the temperature and the catalyst factors) are 84.30% and 89.80% respectively which both are categorized as very good. Moreover, before the guided inquiry learning was applied, the students learning outcomes have not yet categorized as good with classical completeness is in <75%. Otherwise, it has belonged to the good category with classical completeness is in 96% after the guided inquiry learning has been applied. Thus the improvement of the students learning outcomes in using Gain-test has completed with 44% or 11 students are in medium category and 56% or 14 students are in high category.
Key words: learning outcomes, guided inquiry, reaction rate.

INTRODUCTION

An education is the conscious and planned effort in realizing the learning atmosphere and the learning process in order to actively improve the self-potential of the students. In addition, it provides a tool for the students to gain the spiritual religious power, self-control, personality, intelligence, noble character, and skill for their own sake, as well as the society and the nation [1].

Education becomes the significant factor in assessing the development of a country. Based on UU No. 20 in 2003 about the national education system, the education system in Indonesia has already aimed to the ideal aspiration in building the country with full of dignity. Moreover, there are several factors such as the teachers, the students, the infrastructures, and the government regulations which take a great account in acknowledging the quality and the improvement of the education itself.

The Government Regulation No. 19 in 2005 stated that SKL (Standar Kompetensi Lulusan) is the qualification of the student abilities which consists of attitude, knowledge, and skill [2]. Curriculum 2013 which is used in recent education system in Indonesia is the education system which provides an opportunity for the students to learn about their circumstances and to apply what they have learnt in their daily life [3].

Chemistry is the branch of natural science. The senior high school student deals with Chemistry in order to inspect the characteristic, composition, alteration, structure, and dynamics by using the reasoning and the skills. The subject matter which constitutes with the factors of the reaction rate is the concept which needs a verification through an experiment. Thus in order to find out the fact of a concept, knowledge is highly required.

The aim of this study is to describe the learning implementation and the students learning outcomes. According to the interviews with one of the Chemistry teachers in SMA Muhammadiyah 4 Surabaya on 1st November 2016, the chemistry learning process of XI IPA 1 in the academic year of 2016-2017 has been implementing the Curriculum 2013. The Completeness Maximum Criteria (CMC) is 70, nevertheless there were more than 50% students who failed to fulfill the CMC. As consequences, the teachers gave the additional assignment to help the students in achieving the CMC.

Based on the questionnaire which was distributed on 1st November 2016, before the study was conducted, to 25 students of XI IPA1 SMA Muhammadiyah 4 Surabaya, demonstrated that 52% or 13 students said it was difficult to understand the reaction rate materials. Besides that, 64% or 16 students claimed that the teachers did not conduct the experiment which resulted the difficulties of the students in associating the concept and the application of the reaction rate materials.

The problem in understanding the reaction rate materials apparently can be solved by employing the guided inquiry. Besides the opportunity given to the students to do the experiment, the guided inquiry learning is able to develop the students' knowledge. The strengths of this guided inquiry learning are supporting the students to develop and to improve their skills as well as their cognitive processes, reinforcing the students' positive personality, centering to the students' abilities, and developing the appropriate skepticism of the students in discovering the absolute truth [4].

Thus it is necessary to conduct the study about "Guided inquiry learning implementation to improve the students learning outcomes in the subject matter of reaction rate factors."

METHOD

Type of this research is quantitative descriptive with one group pretest-posttest design which is demonstrated by the table 1.

Table 1. Study Design

Pretest	***Treatment***	***Posttest***
T_1	X	T_2

[5]

Information :
T_1= Pretest
X = Treatment with guided inquiry learning
T_2 = Posttest

Students in the XI IPA 1 SMA Muhammadiyah 4 Surabaya who participated in this study. The learning tools of this study are 1) Syllabus, 2) Lesson Plan, 3) Student's worksheet. While the instruments which were used are the guide inquiry of learning implementation's sheet obtained by the observation and pretest and posttest sheet of the students learning outcomes obtained by conducting a test.

The analysis of the guide inquiry learning implementation is using the learning management restriction criteria, as follows:

Table 2. Learning Management Restriction Criteria

Percentage	Corelation Level
0%-20%	Very poor
21%-40%	Poor
41%-60%	Enough
61%-80%	Good
81%-100%	Very Good

Each syntax can be stated as good if only the percentage obtained is ≥ 61% of the syntax's enforceability [6].

The analysis of the improvement of the student learning outcomes is using the n-gain value classification below:

Table 3. Classification N-Gain Value

Value	Criteria
G≥0,7	High
0,3≤G<0,7	Medium
G<0,3	Low

[7]

If 75% of students have already been in medium category $0.3 \leq G < 0.7$, then student learning outcome's improvement has been classically fulfilled. The classical completeness has to be fulfilled by 75% students.

RESULT AND DISCUSSION

The Implementation of Guided Inquiry Learning

The guided inquiry learning consists of five phases. Each phase in the first meeting (the concentration and the surface are factor) and the second meeting (the temperature and the catalyst factor) has increased as shown in the Table 4.

Table 4. Learning Implementation Data

Phase	Percentage of Meeting Implementation			
	1st		2nd	
	%	Category	%	Category
1	86,50	Very Good	89,40	Very Good
2	86,10	Very Good	88,80	Very Good
3	75,00	Good	87,50	Very Good
4	82,50	Very Good	87,50	Very Good
5	91,60	Very Good	95,80	Very Good

The implementation of the guided inquiry learning in the first meeting (the concentration and the surface are factor) and the second meeting (the temperature and the catalyst factor) possessed the average percentage of 84.30% an 89.80% respectively which both are categorized as very good.

Student Learning Outcomes

The improvement of student learning outcomes after the guide inquiry learning has been applied. The gain result is coming from the subtraction of posttest score and pretest score which demonstrates the knowledge improvement or the concept mastery of students after the teaching conducted by the teacher [9]. Thus the improvement of student learning outcomes can be seen through the posttest score and pretest score of the students. There are 44% or 11 students categorized as medium and 56% or 14 students were in high category. The findings suggested the same notion as the Department of Education which states that the guided inquiry learning can help a teacher to associate between the taught materials and the real life situation and also to encourage the students to apply their knowledge in their daily life. Thus it can improve the student learning outcomes and the materials given can be meaningful [8].

The classical completeness of the student learning outcomes has been achieved because its percentage is 96%. The guided inquiry learning effectively completed the learning outcomes of the students of XI IPA 1 SMA Muhammadiyah 4 Surabaya in the subject matter of the determinant factors in reaction rate.

CLOSURE

Conclusion

According to the result of research on the guided inquiry learning implementation about the determinant

factors of reaction rate material, it can be concluded as follows:

1. Guided inquiry learning implementation belongs to the very good category both in the first meeting (the concentration and the surface area factors matter) and the second meeting (the temperature and the catalyst factors matter) with average are 84.30% and 89.80% respectively.
2. The classical completeness of the students learning outcomes shows 96%. The improvement of the students learning outcomes has obtained 44% or 11 students in medium and 56% or 14 students in high category.

Suggestion

Based on the conclusion above, the authors suggest that in order to increase the students learning outcomes, it needs a lot of supervision and training from the teacher continuously. Therefore, it would also keep the students to focus on their improvement.

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